

IN THE CLAIMS:

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1. (Currently Amended) A process for copolymerizing polar and non-polar monomers, characterized in that at least one polar monomer selected from the group consisting of chloroprene, styrene, acrylonitrile, vinyl chloride, acrylic acid, acrylate, cyanacrylate, methacrylic acid, methacrylate, acrylamide, methacrylonitrile, vinyl acetate, propene oxide, ethene oxide, vinyl carbazole, vinylpyrrolidone, vinyl ester, and compounds built up therefrom and at least one non-polar monomer selected from the group consisting of olefin, diolefins and triene are polymerized in the presence of one or more transition metal compounds conforming structurally to ML_aQ_b wherein M is a metal from groups 5-10 of the Periodic System according to the IUPAC 1985, L is a 2-, 3- or 4-dentate chelating ligand, Q is a mono-anionic or non-ionic ligand; b is an integer with that is equal to or greater than 1 and a is calculated as the total number of receptor coordination sites on M - b) / the number of donor coordination sites on the ligand from groups 5-10 of the Periodic System according to IUPAC 1985, one or more radical-producers and optionally one or more co-catalysts.
 2. (Currently Amended) A process according to Claim 1, characterized in that the transition metal compound is chosen so that the transition metal compound, optionally in the presence of a co-catalyst, reversibly forms a complex with the radically growing polymer chain and the said non-polar monomers are inserted into the bond thus formed between transition metal and polymer chain.
 3. (Previously Presented) A process according to Claim 1 characterized in that the radical-producer is chosen so that the radical-producer(s) initiate polymerization and do not react in a detrimental fashion with the transition metal compound.

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4. (Previously Presented) A process according to Claim 1 characterized in that one or more transition metal complex cation forming compounds or coordination complex compounds are used as co-catalyst, chosen from the group of strong, neutral Lewis acids, ionic compounds with Lewis acid cations or Broenstedt acid cations and non-coordinating anions.
 5. (Currently Amended) A composition containing one or more transition metal compounds from groups 5-10 of the Periodic System according to IUPAC 1985, conforming structurally to ML_aQ_b wherein M is a metal from groups 5-10 of the Periodic System according to the IUPAC 1985, L is a 2-, 3- or 4-dentate chelating ligand, Q is a mono-anionic or non-ionic ligand, b is an integer with that is equal to or greater than 1 and a is calculated as the total number of receptor coordination sites on M - b) / the number of donor coordination sites on the ligand one or more radical-producers and optionally one or more co-catalysts.
 6. (Original) A composition according to Claim 5, characterized in that the transition metal is chosen from vanadium, chromium, manganese, iron, cobalt, nickel, ruthenium, rhodium and palladium.
 7. (Previously Presented) A composition according to Claim 5 characterized in that the radical-producer is a peroxide, a diazo compound or a mixture thereof.
 8. (Previously Presented) A composition according to Claim 5 characterized in that one or more compounds chosen from the group of strong, neutral Lewis acids, ionic compounds with Lewis acid cations or Broenstedt acid cations and non-coordinating anions are used as co-catalysts.
 9. (Currently Amended) A composition according to Claim 5 characterized in that the transition metal compound is chosen so that the transition metal compound, optionally in the presence of a co-catalyst, can reversibly form a com-

plex with a radically growing polymer chain and non-polar monomers selected from the group consisting of olefin, diolefin and triene can be inserted into the bond formed in this way between transition metal and polymer chain.

10. (Currently Amended) A method of using the composition according to Claim 5 comprising catalyzing the copolymerization of copolymers monomers.
11. (Previously Amended) Copolymers which have a statistical distribution on the molecular level prepared in a process according to Claim 1.
12. (Cancelled).
13. (Currently Amended) A process for producing a copolymer comprising polymerizing at least one polar monomer selected from the group consisting of chloroprene, styrene, acrylonitrile, vinyl chloride, acrylic acid, acrylate, cyanacrylate, methacrylic acid, methacrylate, acrylamide, methacrylonitrile, vinyl acetate, propene oxide, ethene oxide, vinyl carbazole, vinylpyrrolidone, vinyl ester, and compounds built up therefrom and at least one non-polar monomer selected from the group consisting of olefin, diolefin and triene in the presence of one or more compounds of transition metals ~~of groups 5 to 10 of the Periodic System according to IUPAC 1985 conforming structurally to ML_aQ_b wherein M is a metal from groups 5-10 of the Periodic System according to the IUPAC 1985, L is a 2-, 3- or 4-dentate chelating ligand, Q is a mono-anionic or non-ionic ligand, b is an integer with that is equal to or greater than 1 and a is calculated as the total number of receptor coordination sites on M - b) / the number of donor coordination sites on the ligand and one or more radical-producers.~~
14. (Previously Presented) The process of Claim 13 wherein the polymerizing is in the further presence of one or more co-catalysts.
15. (Previously Presented) The copolymer prepared by the process of Claim 13.

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16. (Currently Amended) A composition containing one or more transition metal compounds from groups 5-10 of the Periodic System according to IUPAC 1985 conforming structurally to ML_aQ_b wherein M is a metal from groups 5-10 of the Periodic System according to the IUPAC 1985, L is a 2-, 3- or 4-dentate chelating ligand, Q is a mono-anionic or non-ionic ligand, b is an integer with that is equal to or greater than 1 and a is calculated as the total number of receptor coordination sites on M - b) / the number of donor coordination sites on the ligand and one or more radical-producers.
 17. (Previously Presented) The composition of Claim 16 further containing one or more co-catalysts.
 18. (Previously Presented) The composition of Claim 16 wherein the transition metal a member selected from the group consisting of vanadium, chromium, manganese, iron, cobalt, nickel, ruthenium, rhodium and palladium.
 19. (Previously Presented) The composition of Claim 16 wherein the radical-producer is at least one member selected from the group consisting of peroxide and a diazo compound.
 20. (Previously Presented) The composition of Claim 17 wherein the co-catalyst is selected from the group consisting of strong Lewis acids, neutral Lewis acids, ionic compounds with Lewis acid cations, ionic compounds with Broenstedt acid cations, and non-coordinating anions.
 21. (Previously Presented) A method of using the copolymer of Claim 15 comprising preparing a molded article.
 22. (Previously Presented) A method of using the copolymer of Claim 15 comprising preparing an adhesive.